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| 10/566,741 | 01/31/2006 | Giorgio Macor | 11/2-22935/A/PCT | 9743 |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/566,741 | Applicant(s) MACOR ET AL. | |
| | Examiner JOEL G. HORNING | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) 19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 16 and 17 have been newly cancelled. Claims 19 and 20 are withdrawn.
Claims 1-15 and 21 are now being considered on their merits.

Election/Restrictions

2. Claims 19 and 20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 06-10-2009.

Information Disclosure Statement

3. The information disclosure statement filed May 1st 2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each document listed that is not in the English language (H. Jacobasch et al reference). It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. **Claims 1-6, 8-11 and 21** are rejected under 35 U.S.C. 102(b) as being anticipated by Bauer et al (US 6548121).

The instant claim 1 is directed towards a process for the production of a strongly adherent metal coating on an inorganic or organic substrate, wherein:

- a. A low temperature plasma treatment, a corona discharge treatment or a flame treatment is carried out on the substrate;
- b. One or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate;
- c. The layer is *optionally* dried and is irradiated with electromagnetic waves; and
- d. On such a photoinitiator coated substrate, a metal, half-metal or metal oxide is deposited from the gas phase

It is noted that the step “c” drying step is optional. Since the step is optional it is not required for the claim language to be met.

‘121 teaches a process for producing a strongly adhering coating on an organic or inorganic substrate. This method comprises: A low temperature plasma treatment is carried out on the substrate (step a); one or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate (step b), and on such a photoinitiator coated substrate, a metal, half-metal or metal oxide is deposited from the gas phase *while* the substrate is irradiated with electromagnetic waves (steps “c” and “d”) (**claims 1 and 2**) (col 1, line 50 through col 2, line 12).

5. Regarding **claims 3-6**, '121 teaches many different photoinitiators. The photoinitiator can be benzophenones (**claim 3**) (col 17, lines 49-67). The photoinitiator is preferably a subset of the formulas of **claim 4** (col 6 line 61 through col 7, line 8). In which (IN) is further preferably limited by a subset of the formulas of **claim 5** (col 7, line 9 through col 8, line 4). In which (RG) and (RG') are further especially preferably limited by a subset of the formulas of **claim 6** (col 8, line 65 through col 9, line 10). Additionally, example 1 teaches using a photoinitiator which meets the limitations of **claims 4 and 5** (col 23, lines 29-40).
6. Regarding **claim 8-10 and 21**, '121 teaches an example 3, which deposits a metal layer on the photoinitiator layer of example 1. Example 1 exposes the substrate to a plasma formed from a mixture of argon and oxygen (**claims 8, 9 and 21**). Furthermore, the photoinitiator layer of example 1 is 30 nm thick (**claim 10**) (col 23 line 17 through col 24 line 21).
7. Regarding **claim 11**, '121 teaches performing the application of the photoinitiator (step "b") as soon as possible after the corona discharge treatment (process step "a") and suggests doing so in a continuous process (col 15, lines 15-20). It is clearly envisaged from this that step b would be performed immediately after step "a" and certainly would be performed within 24 hours of step "a".

Additionally, '121 teaches performing step "b" immediately after or within 10 hours of process step "a" (col 28, lines 22-25, as further defined by col 24, lines 55-67).

Claim Rejections - 35 USC § 103

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. **Claims 11-13 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121).
9. Regarding **claim 11**, '121 teaches performing the application of the photoinitiator (step "b") as soon as possible after the corona discharge treatment (process step "a") and suggests doing so in a continuous process (col 15, lines 15-20). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to perform step "b" immediately after step "a" and certainly to perform it within 24 hours of step "a".
10. Regarding **claim 12**, '121 teaches that the photoinitiators can be used in combination with a solvent (col 15, lines 7-27), so materials other than photoinitiators are taught to be present in the composition. MPEP 2144.05 (II) states: "Generally, differences in concentration or temperature will not support the patentability of subject matter

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encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'"

11. Regarding **claim 13**, '121 teaches that the process allows a high throughput per unit time (col 1, lines 50-51). The examiner takes official notice that waiting time between process steps is a well known variable for determining the maximum throughput per unit time of a process. Decreasing the waiting times between processing steps, decreases the total time for the overall process and increases the maximum throughput of a process.

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to reduce the waiting times as much as possible and perform step "c" immediately after step "b" in order to allow for a higher throughput per unit of time as taught to be desirable by '121.

12. Regarding **claim 15**, '121 teaches performing the irradiation step with ultraviolet light (col 2, lines 9-12). Ultraviolet radiation's wavelength ranges from 400nm to 10nm, which overlaps with applicant's claimed range. MPEP 2144.05 states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists."

13. **Claims 7 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) as applied to claim 1 above, and further in view of Kohler et al (US 6251963).

'121 teaches that the photoinitiators can be used in combination with a solvent (col 15, lines 7-27), but does not teach that the solvent is a liquid or what should be done with the solvent after the photoinitiator layer is deposited.

However, '963 is also directed towards depositing films of photoinitiators and teaches using liquid solvents with the photoinitiators in order to form a solution which is then deposited on the substrate (col 18, lines 31-48).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to choose to use a liquid solvent with the photoinitiator compositions containing a solvent of '121 as a known manufacturing option for depositing a film of a photoinitiator composition, which would produce predictable results (**claim 7**).

14. Regarding **claim 14**, '963 teaches that after the substrate is coated with the liquid solution photoinitiator, the solvents are normally removed by drying (col 19, lines 29-31).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to then dry the liquid solution after the layer has been deposited since it was recognized to be the normal procedure for such liquid solvent bearing coatings.

'963 further teaches drying the photoinitiator film at elevated temperatures (col 25, lines 51-52) and that it is advantageous to dry photoinitiators at elevated temperatures under a vacuum (col 4, lines 39-42). The use of a reduced pressure

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environment with the heating step would require that the coating be heated inside a vacuum chamber, which would be, by definition, an oven.

Thus it would have further been obvious to a person of ordinary skill in the art at the time of invention to dry the photoinitiator coating at elevated temperatures under a vacuum in an oven, since it was known to the art to be an advantageous method for drying photoinitiators and would produce predictable results (**claim 14**).

15. **Claims 1,3-6, 8, 9, 11-13, 15 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 6153503) in view of Bauer et al (US 6548121) as applied to claim 1 above.

Regarding **claim 1**, Lin et al teaches a method for producing electrodes on a substrate by using a lithography method with a photoresist (col 3, lines 19-22). In this method, a photoinitiator (in a photoresist) is applied to the surface of the substrate, the layer is irradiated with electromagnetic waves (which as is known to the photoresist art, as discussed previously, will crosslink certain areas of the coating) and be *developed*, so that regions of the coating that are not crosslinked are removed, forming a pattern in the photoresist. The patterned surface is then sputter coated (a gas phase deposition) with an electrode material, such as aluminum metal. The substrate is then treated with a solvent and mechanically lifted off, so that the photoinitiator layer is removed, leaving the pattern of electrodes on the substrate surface (figure 1, col 4, lines 4-24). However, Lin et al does not teach what photoinitiators are to be used or the use of a plasma treatment on the substrate surface prior to depositing the photoinitiator.

'121 teaches a method for depositing photoinitiator containing layers for image forming resist coatings, which are strongly adhered which is taught to be important for resist applications (col 23, lines 10-16). It teaches that such photoinitiator coatings will be strongly adhered to the substrate by using a process that includes: subjecting the substrate to a low-temperature plasma discharge before depositing a coating comprising a photoinitiator that contains at least one ethylenically unsaturated group, then coating the substrate with a composition comprising one ethylenically unsaturated monomer or oligomer (col 1, line 59 through col 2, line 8).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention using the Lin et al process to substitute the Lin et al method of depositing a photoinitiator containing coating with the '121 taught method for depositing said film then performing the remaining process of Lin et al. Such a person would be motivated to do so in order to produce a strongly adhering photoinitiator coating (**claim 1**).

16. Regarding **claims 3-6, 8, 9, 11-13, 15 and 21**, they are rejected for the same reasons they were previously in '121, but now applied to the method of Lin et al.
17. **Claim 7 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 6153503) in view of Bauer et al (US 6548121) further in view of Kohler et al (US 6251963), as applied to claims 7 and 14 above.
18. Regarding **claims 7 and 14**, they are rejected for the same reasons they were previously in '121 further in view of '963, but now applied to the method of Lin et al.

Terminal Disclaimer

19. The terminal disclaimer filed on June 10th, 2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent issuing from application 10/556609 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

20. Applicant's arguments filed June 10th, 2009 have been fully considered but they are not persuasive.

21. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., wherein the photoinitiator layer "is cured by irradiation" or "radiative curing of the primer layer before metal, semi-metal or metal oxide deposition") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In particular, the irradiation of the "primer material" does not require any curing to take place, and the deposition of the "coating" layer only requires that the "primer layer" has already been deposited on the substrate, not that the "primer layer" has already been irradiated.

Furthermore, it is noted that even if applicant requires the irradiation step c to be different from the step d, if applicant does not specifically require the step to cure the primer layer, the examiner would rejected it because it is obvious to expose the

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coating to ambient light in order to observe the deposited film to ensure it has been deposited and uniformly for quality control purposes.

22. Applicant argues that the Lin et al produced photoresist layer which has metal deposited on it is "not encompassed by Applicants adherent coating." The basis of the argument is that the Lin et al layer will eventually be removed in the course of the lithography process that it is an "easily" removable layer and is not a "strongly adherent" coating of applicant's invention. The examiner disagrees for two reasons. First, "strongly adherent" is a relative term. In order to accurately reproduce the image in the lithography, the polymeric layer must adhere strongly to the substrate so that it is not removed by the washing process that removes the coating that is the image negative. Additionally, the metal layer on the polymeric layer should adhere strongly to it, so when they are removed, they come off together, so that metal whiskers do not remain on the surface that could lead to electrical shorts. So Lin et al would benefit from the strongly adherent coating that is taught by Bauer et al to be useful for lithography processes. Second, the claim language does not actually require that the polymeric material "strongly adhere" to the substrate surface. The claim language (in the preamble) is directed toward a process that produces a strongly adherent metal coating. A person of ordinary skill in the art is highly motivated to have the metal layer remaining after the resist is removed "strongly adhere" to the substrate surface, so that the desired metal image will not also be removed during the removal of the resist.

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23. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, In this case, as stated in the rejection above, Lin et al is directed to a photoresist lithography process and Bauer et al is directed towards photoinitiator containing layers for image forming resist coatings, which are strongly adhered to the substrate which is taught to be important for such resist applications (col 23, lines 10-16). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to modify the photoresist lithography process of Lin et al by using the strongly adhering coatings of Bauer et al in order to improve the adhesion of the photoresist layers because Bauer et al teaches that strong adhesion of such coatings is an important property for lithography processes (like that of Lin et al).

Conclusion

24. No current claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL G. HORNING whose telephone number is (571) 270-5357. The examiner can normally be reached on M-F 9-5pm with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael B. Cleveland can be reached on (571)272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. H./
Examiner, Art Unit 1792

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1792